

WHAT IS CLAIMED IS:

1. A product metering napkin dispenser comprising:

a) a napkin magazine for receiving a stack of folded napkins;

(b) shelf means for releasably retaining said stack of folded napkins about a terminal portion of said napkin magazine;

(c) a metering member; and

(d) means for providing relative motion between said metering member and said shelf means,

wherein said shelf means, metering member and said means for providing relative motion between said metering member and said shelf means are configured and arranged such that said metering member penetrates said stack of napkins a predetermined distance from said shelf means in a metering operation thereby segregating a predetermined number of napkins from the remainder of said stack for dispensing.

2. The napkin dispenser according to Claim 1, wherein said napkin dispenser is a gravity feed napkin dispenser and said shelf means are located about the lower portion of said napkin magazine.

3. The napkin dispenser according to Claim 2, wherein said means for providing relative motion between said metering member and said shelf means are coupled to said metering member and adapted to advance the metering member to penetrate the stack of folded napkins in said metering operation and retract said

metering member from said stack so as to allow napkins to advance toward said shelf means.

4. The napkin dispenser according to Claim 1, wherein said shelf means are movable
5 with respect to said stack of folded napkins in said napkin magazine.
5. The napkin dispenser according to Claim 4, wherein said shelf means are hinged about the lower portion of said napkin magazine so as to be adapted to swing downwardly to release napkins.
- 10 6. The napkin dispenser according to Claim 4, wherein said shelf means are rotatably mounted about a shaft and are configured to release napkins upon rotation of said shaft.
- 15 7. The napkin dispenser according to claim 1, wherein said metering member comprises a pivotally mounted member adapted to penetrate said stack in a metering operation.
8. The napkin dispenser according to Claim 1, wherein said metering member
20 comprises a member rotatably mounted about a shaft.
9. The napkin dispenser according to Claim 1, wherein said metering member is mounted on a metering carriage adapted for reciprocating motion with respect to said stack of folded napkins.
- 25 10. The napkin dispenser according to Claim 1, wherein said napkin dispenser is a gravity feed napkin dispenser and said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 8° to about 15° with respect to a vertical.

11. The napkin dispenser according to Claim 10, wherein said napkin dispenser is a gravity feed napkin dispenser and said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 10° to about 12° with respect to said vertical.

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12. The napkin dispenser according to Claim 1, wherein said stack of folded napkins comprises a plurality of folded napkins with a continuous surface about at least one edge thereof arranged in a stack such that said continuous surfaces are along one face of said stack and said metering member penetrates said stack at the face presenting the continuous surfaces of said folded napkins.

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13. The napkin dispenser according to Claim 12, wherein said folded napkins are provided with a plurality of panels of substantially equal size.

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14. The napkin dispenser according to Claim 13, wherein said folded napkins are provided with 3 panels of substantially equal size.

15. The napkin dispenser according to Claim 13, wherein said folded napkins are provided with 4 panels of substantially equal size.

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16. The napkin dispenser according to Claim 12, wherein said napkin magazine is inclined at an angle of from about 8° to about 15° with respect to a vertical such that the napkin stack has a lowermost portion and said metering member penetrates said stack about said lowermost portion.

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17. The napkin dispenser according to Claim 1, wherein said napkin magazine is provided with a plurality of support ridges projecting into the interior thereof configured to frictionally engage said stack of folded napkins and distribute its weight to the walls of said napkin dispenser.

18. A product metering napkin dispenser comprising:

(a) a housing defining a napkin magazine for receiving a stack of folded napkins;

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(b) a movable shutter configured for retaining said stack of folded napkins in said housing in a closed position;

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(c) a metering member configured so as to be capable of retaining said stack of folded napkins in said housing,

wherein said movable shutter and metering member are positioned, configured and dimensioned to cooperate to dispense a predetermined number of napkins in a dispensing operation whereupon:

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(i) said metering member penetrates said stack of folded napkins a predetermined distance from said movable shutter in said closed position thereby segregating said predetermined number of napkins from the remainder of napkins in said stack and thereby retaining the remainder of napkins in said stack in said housing; and

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(ii) said movable shutter moves to an open position thereby releasing said predetermined number of napkins.

25 19. The napkin dispenser according to Claim 18, wherein said movable shutter is hinged about the lower portion of said napkin magazine so as to be adapted to swing downwardly to release napkins.

20. The napkin dispenser according to Claim 18, wherein said movable shutter is rotatably mounted about a shaft and are configured to release napkins upon rotation of said shaft.
- 5 21. The napkin dispenser according to Claim 18, wherein said metering member comprises a pivotally mounted member adapted to penetrate said stack in a metering operation.
- 10 22. The napkin dispenser according to Claim 18, wherein said metering member comprises a member rotatably mounted about a shaft.
- 15 23. The napkin dispenser according to Claim 18, wherein said metering member is mounted on a metering carriage adapted for reciprocating motion with respect to said stack of folded napkins.
- 20 24. The napkin dispenser according to Claim 18, wherein said napkin dispenser is a gravity feed napkin dispenser and said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 8° to about 15° with respect to a vertical.
- 25 25. The napkin dispenser according to Claim 24, wherein said napkin dispenser is a gravity feed napkin dispenser and said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 10° to about 12° with respect to said vertical.
26. A product metering napkin dispenser comprising:
- (a) a housing defining a napkin magazine for receiving a stack of folded napkins;

(b) a movable shutter hinged to said housing for retaining said stack of folded napkins in said housing in a closed position;

5 (c) a metering member pivotally mounted on said housing and coupled to said movable shutter, said metering member being configured so as to be capable of retaining said stack of folded napkins in said housing,

10 wherein said movable shutter and metering member are positioned, configured and dimensioned to cooperate to dispense a predetermined number of napkins in a dispensing operation whereupon pivotal motion of said metering member:

15 (i) said metering member penetrates said stack of folded napkins a predetermined distance from said movable shutter in said closed position thereby segregating said predetermined number of napkins from the remainder of napkins in said stack and thereby retaining the remainder of napkins in said stack in said housing; and

20 (ii) said hinged movable shutter swings to an open position thereby releasing said predetermined number of napkins.

25 27. The napkin dispenser according to Claim 26, wherein said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 8° to about 15° with respect to a vertical.

28. The napkin dispenser according to Claim 27, wherein said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 10° to about 12° with respect to said vertical.

29. The napkin dispenser according to Claim 26, wherein said napkin magazine is provided with a plurality of support ridges projecting into the interior thereof configured to frictionally engage said stack of folded napkins and distribute its weight to the walls of the napkin dispenser.
30. The napkin dispenser according to Claim 26, wherein said movable shutter comprises an arcuate plate.
31. The napkin dispenser according to Claim 30, wherein said movable shutter is hinged below its centerline so that said movable shutter falls away downwardly about its hinged portion as it opens downwardly.
32. The napkin dispenser according to Claim 30 wherein said metering member comprises said metering plate affixed to a lever handle, wherein said metering plate is generally perpendicular thereto.
33. The napkin dispenser according to Claim 32, wherein said lever handle and said metering plate are integrally formed.
34. The napkin dispenser according to Claim 32, wherein said metering plate is generally arcuate in shape and said movable shutter comprises an arcuate plate.
35. The napkin dispenser according to Claim 32, wherein said metering plate has a blunted knife edge portion adapted to penetrate said stack.
36. The napkin dispenser according to Claim 32, further comprising means for adjusting the predetermined distance between said metering member and said movable shutter.

37. The napkin dispenser according to Claim 36, wherein said means for adjusting the predetermined distance between said metering member and said movable shutter comprises an offset axle about which said lever handle is pivotally mounted.
- 5 38. The napkin dispenser according to Claim 26, further comprising means for biasing said movable shutter to said closed position.
39. A product metering, gravity feed napkin dispenser comprising:
- 10 (a) a housing defining a napkin magazine for receiving a stack of folded napkins;
- (b) a movable shutter hinged to said housing for supporting said stack of folded napkins about the lower portion of said napkin magazine in a
- 15 closed position;
- (c) a cam member coupled to said movable shutter for positioning said movable shutter, said cam member being provided with a cam surface of suitable configuration;
- 20 (d) a pivotally mounted metering member coupled to said movable shutter by way of said cam member, said metering member including means for engaging the cam surface of said cam member, thereby positioning said movable shutter, said metering member being adapted to support said
- 25 stack of folded napkins upon penetration thereof;

wherein said movable shutter, cam member and metering member are positioned, configured and dimensioned to cooperate to dispense a

predetermined number of napkins in a dispensing operation whereupon pivotal motion of said metering member:

5 (i) said metering member penetrates said stack of folded napkins a predetermined distance above said movable shutter in said closed position thereby segregating said predetermined number of napkins from the remainder of napkins in said stack and thereby supporting the remainder of napkins in said stack; and

10 (ii) said hinged movable shutter swings downwardly to an open position as said means for engaging the cam surface of said metering member move along the cam surface thereby releasing said predetermined number of napkins.

15 40. The napkin dispenser according to Claim 39, wherein said movable shutter is freely rotating and driven by said cam member.

41. The napkin dispenser according to Claim 40, wherein said cam member and said metering member are adapted to urge said movable shutter upwardly to said
20 closed position between dispensing operations.

42. The napkin dispenser according to Claim 39, wherein said cam member includes means for limiting the rotation of said metering member in the direction opposite the dispensing rotation.

25 43. The napkin dispenser according to Claim 39, wherein said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 8° to about 15° with respect to a vertical.

44. The napkin dispenser according to Claim 43, wherein said napkin magazine is inclined so as to accommodate said stack of napkins at an angle of from about 10° to about 12° with respect to said vertical.
- 5 45. The napkin dispenser according to Claim 39, wherein said napkin magazine is provided with a plurality of support ridges projecting into the interior thereof configured to frictionally engage said stack of folded napkins and distribute its weight to the walls of the napkin dispenser.
- 10 46. The napkin dispenser according to Claim 39 wherein said movable shutter comprises an arcuate plate.
57. The napkin dispenser according to Claim 39, wherein said movable shutter is hinged below its centerline so that said movable shutter falls away downwardly
15 about its hinged portion as it opens downward.
48. The napkin dispenser according to Claim 39 wherein said metering member comprises a metering plate affixed to a lever handle and wherein said metering plate is generally perpendicular thereto.
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49. The napkin dispenser according to Claim 48, wherein said lever handle and said metering plate are integrally formed.
50. The napkin dispenser according to Claim 48 wherein said metering plate is
25 generally arcuate in shape and said movable shutter comprises an arcuate plate.
51. The napkin dispenser according to Claim 48, wherein said metering plate includes a blunted knife-edge portion adapted to penetrate said stack.

52. The napkin dispenser according to Claim 48, further comprising means for adjusting the predetermined distance between said metering member and said movable shutter.

5 53. The napkin dispenser according to Claim 52, wherein said means for adjusting the predetermined distance between said metering member and said movable shutter comprises an offset axle about which said lever handle is pivotally mounted.

54. A product metering napkin dispenser comprising:

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(a) a housing defining a napkin magazine for receiving a stack of folded napkins;

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(b) a movable retaining shutter mounted to rotate in a dispensing plane for retaining said stack of napkins in said housing in a closed position;

(c) a metering shutter mounted to rotate concurrently with said movable retaining shutter at a predetermined distance from said retaining shutter,

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wherein said movable retainingshutter and metering member are positioned, configured and dimensioned to cooperate to dispense a predetermined number of napkins in a dispensing operation whereupon rotation of said retaining shutter and said metering shutter:

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(i) said metering shutter revolves to penetrate said stack of folded napkins at said predetermined distance from said movable support shutter thereby segregating said predetermined number of napkins from the remainder of napkins in said stack and thereby retaining the remainder of napkins in said stack in said housing; and

- (ii) said movable support shutter revolves to an open position thereby releasing said predetermined number of napkins.

5 55. The napkin dispenser according to Claim 54, wherein said retaining shutter is generally semi-circular disk-shaped.

56. The napkin dispenser according to Claim 54, wherein said retaining shutter has a downwardly inclined trailing portion configured to facilitate the release of said
10 predetermined number of napkins.

57. The napkin dispenser according to Claim 54, wherein said metering shutter is generally semi-circular disk-shaped.

15 58. The napkin dispenser according to Claim 54, wherein said metering shutter is provided with a blunted knife-edge adapted to penetrate said stack of folded napkins.

59. The napkin dispenser according to Claim 58, wherein said metering shutter is
20 provided with a slot portion proximate to said blunted knife edge of said metering shutter.

60. The napkin dispenser according to Claim 54, further comprising means for adjusting the predetermined distance between said retaining shutter and said
25 metering shutter.

61. The napkin dispenser according to Claim 54, further comprising biasing means to urge said support shutter to said closed position.

62. A product metering, gravity feed napkin dispenser comprising:

(a) a housing defining a napkin magazine for receiving a stack of folded napkins;

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(b) a rotatable shaft mounted in said housing;

(c) a movable support shutter mounted on said shaft to rotate in a dispensing plane for supporting said stack of napkins about the lower portion of said napkin magazine in a closed position;

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(d) a metering shutter mounted on said shaft to rotate concurrently with said movable shutter at a predetermined distance above said support shutter; and

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(e) drive means coupled to said shaft for imparting rotational motion thereto,

wherein said movable support shutter, metering shutter, shaft and drive means are positioned, configured and dimensioned to cooperate to dispense a predetermined number of napkins in a dispensing operation whereupon rotation of said shaft:

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(i) said metering shutter revolves to penetrate said stack of folded napkins a predetermined distance above said movable support shutter thereby segregating said predetermined number of napkins from the remainder of napkins in said stack and thereby supporting the remainder of napkins in said stack; and

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(ii) said movable support shutter revolves to an open position thereby releasing said predetermined number of napkins.

- 5 63. The napkin dispenser according to Claim 62, wherein said support shutter is generally semi-circular disk-shaped.
- 10 64. The napkin dispenser according to Claim 62, wherein said support shutter has a downwardly inclined trailing portion configured to facilitate the release of said predetermined number of napkins.
- 15 65. The napkin dispenser according to Claim 62, wherein said metering shutter is generally semi-circular disk-shaped.
- 15 66. The napkin dispenser according to Claim 62 wherein said metering shutter is provided with a blunted knife-edge adapted to penetrate said stack of folded napkins.
- 20 67. The napkin dispenser according to Claim 66, wherein said metering shutter is provided with a slot position proximately to said blunted knife edge of said metering shutter.
- 25 68. The napkin dispenser according to Claim 62, further comprising means for adjusting the predetermined distance between said support shutter and said metering shutter.
69. The napkin dispenser according to Claim 62, further comprising biasing means to urge said support shutter to said closed position.
70. The napkin dispenser according to Claim 69, wherein said biasing means

comprise a biasing spring about said rotatable shaft.

71. The napkin dispenser according to Claim 70, wherein said drive means comprise
gear mounted on said rotatable shaft and a rack mounted on a drive member
5 slidably secured to said housing.

72. A product metering napkin dispenser comprising:

- 10 (a) a housing defining a napkin magazine for receiving a stack of folded napkins;
- (b) a retaining member releasably supporting said stack of folded napkins about a dispensing plane at a terminal portion of said napkin magazine;
- 15 (c) a metering carriage provided with a napkin metering member projecting from said metering carriage;
- (d) a guide configured for directing said metering carriage during
20 operation of said napkin dispenser, said guide having an inward portion and an outward portion, said inward portion being disposed proximately to said stack of folded napkins for guiding said metering carriage during a dispensing stroke over which napkins are dispensed and said outward portion being disposed outwardly with respect to said
25 inward portion for guiding said metering carriage following said dispensing stroke;
- (e) biasing means to urge said metering carriage to a rest position; and

(f) drive means coupled to said metering carriage for advancing said metering carriage along said guide in the dispensing cycle, said drive means being generally adapted to overpower the force exerted on the metering carriage by said biasing means,

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said guide and metering carriage being configured and arranged such that during said dispensing stroke said metering member penetrates said stack of folded napkins at a predetermined distance from said dispensing plane and exerts a force on a predetermined number of folded napkins which are thereby released from said retaining member as said metering carriage advances along said inward portion of said guide.

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73. The product metering napkin dispenser according to Claim 72, wherein said retaining member comprises a generally planar member defining a dispensing aperture having a length substantially shorter than the dispensing length of said napkins.

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74. The product metering napkin dispenser according to 73, wherein said dispensing aperture has a length of from about 10% to about 30% shorter than the dispensing length of said napkins.

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75. The product metering napkin dispenser according to Claim 74, wherein said dispensing aperture has a length of from about 15% to about 25% shorter than the dispensing length of said napkins.

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76. The product metering napkin dispenser according to Claim 73, wherein the width of said dispensing aperture is less than the dispensing width of said napkins.

77. The product metering napkin dispenser according to Claim 72 further comprising a gripping member adapted to cooperate with said metering member to grip said

predetermined number of folded napkins between said metering member and said gripping member during said dispensing stroke.

5 78. The product metering napkin dispenser according to Claim 72, further comprising second biasing means adapted to urge said gripping member towards said metering member during said dispensing stroke.

10 79. The product metering napkin dispenser according to Claim 78, further comprising third biasing means adapted to urge said gripping member away from said metering member at about the completion of said dispensing stroke and to urge said metering carriage towards said outer portion of said guide at about the completion of said dispensing stroke.

15 80. The product metering napkin dispenser according to Claim 79, further comprising fourth biasing means for urging said metering carriage towards said inner portion of said guide from said rest position.

20 81. The product metering napkin dispenser according to Claim 72, wherein said metering carriage is provided with a plurality of mounting shafts and said guide comprises a pair of opposed tracks for receiving said mounting shafts.

82. A product metering, gravity feed napkin dispenser comprising:

25 (a) a housing defining a storage chamber for receiving a stack of folded napkins, said folded napkins presenting a folded napkin length and a folded napkin width at the bottom of said stack;

(b) a support releasably supporting said stack of folded napkins about a dispensing plane at the lower extremity of said storage chamber;

(c) a reciprocating metering member; and

(d) means for mounting said reciprocating metering member including
means for biasing said reciprocating metering member towards a rest
position; and

(e) drive means coupled to said means for mounting said reciprocating
metering member;

wherein the aforesaid components are constructed and arranged such
that said drive means advance said reciprocating metering member in a
dispensing stroke where the reciprocating metering member penetrates said
stack of napkins a predetermined distance above said dispensing plane
corresponding to a predetermined number of folded napkins and exerts a
downward force thereon as the metering member advances in said dispensing
stroke.

83. The product metering, gravity feed napkin dispenser according to Claim 82,
wherein said means for mounting said reciprocating metering member includes a
metering carriage provided with a plurality of mounting shafts and said guide
comprises a pair of opposed tracks for receiving said mounting shafts.

84. The product metering, gravity feed napkin dispenser according to Claim 83,
wherein said support comprises a generally planar member defining a dispensing
aperture having a length substantially shorter than the dispensing length of said
napkins.

85. The product metering, gravity feed napkin dispenser according to Claim 84,

wherein the width of said dispensing aperture is less than the dispensing width of said napkins.

5 86. The product metering, gravity feed napkin dispenser according to Claim 84,
further comprising a gripping member adapted to cooperate with said metering
member to grip said predetermined number of folded napkins between said
metering member and said gripping member and second biasing means adapted to
urge said gripping member towards said metering member during said dispensing
stroke.

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87. A method of dispensing a predetermined number of folded napkins comprising:

- 15 (a) disposing a stack of folded napkins in a napkin magazine about a
retaining member releasably retaining said stack;
- (b) penetrating said stack with a metering member such that said metering
member is between said predetermined number of napkins and the
remainder of napkins in said stack; and
- 20 (c) providing relative motion between said retaining member and said
metering member operative to dispense said predetermined number of
napkins.

25 88. The method according to Claim 87, wherein said napkin magazine is defined by a
housing and said retaining member comprises a movable shutter hinged to said
housing adapted to swing open downwardly during a dispensing operation.

89. The method according to Claim 88, wherein said metering member is pivotally mounted on said housing and is adapted to support said remainder of napkins in said stack during a dispensing operation.
- 5 90. The method according to Claim 89, wherein said movable shutter is coupled to said metering member by way of a cam.
91. The method according to Claim 90, wherein said cam and said metering member are configured to urge said movable shutter upwardly to a closed position between
10 dispensing operations.
92. The method according to Claim 90, wherein said cam member includes means for limiting the rotation of said metering member in the direction opposite dispensing rotation.
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93. The method according to Claim 87, wherein said retaining member comprises a movable support shutter mounted to rotate in a dispensing plane about the lower portion of said napkin magazine.
- 20 94. The method according to Claim 93, wherein said metering member comprises a metering shutter mounted to rotate concurrently with said movable support shutter.
95. The method according to Claim 94, wherein said movable support shutter and
25 said metering shutter are mounted on a rotatable shaft.
96. The method according to Claim 94, wherein said metering shutter revolves to penetrate said stack and support the remainder of said stack during a dispensing operation and said movable support shutter revolves away from said stack to an

open position during a dispensing operation, thereby releasing said predetermined number of napkins.

- 5 97. The method according to Claim 94, wherein said support shutter and said metering shutter are generally semi-circular disk-shaped.
98. The method according to Claim 87, wherein said retaining member comprises a generally C-shaped aperture.
- 10 99. The method according to Claim 98, wherein said metering member moves downwardly in a dispensing stroke to urge said predetermined number of napkins through said aperture in a dispensing operation.
- 15 100. The method according to Claim 99, wherein said metering member is biased upwardly.
101. The method according to Claim 87, wherein a gripping member cooperates with said metering member to grip said predetermined number of napkins during said dispensing operation.
- 20 102. The method according to Claim 87, wherein said metering member is mounted in a metering carriage coupled to guide means for directing the motion of said carriage during operation of said napkin dispenser.
- 25 103. The method according to Claim 87, wherein said stack of folded napkins comprises a plurality of folded napkins with a continuous surface about at least one edge thereof arranged in a stack such that said continuous surfaces are along one face of said stack and said metering member penetrates said stack at the face presenting the continuous surfaces of said folded napkins.

104. The method according to Claim 103, wherein said folded napkins are provided with a plurality of panels of substantially equal size.
105. The method according to Claim 104, wherein said folded napkins are provided
5 with 3 panels of substantially equal size.
106. The method according to Claim 104, wherein said folded napkins are provided with 4 panels of substantially equal size.
- 10 107. The method according to Claim 103, wherein said napkin magazine is inclined at an angle of from about 8° to about 15° with respect to a vertical such that the napkin stack has a lowermost portion and said metering member penetrates said stack about said lowermost portion.
- 15 108. The method according to Claim 87, wherein said napkin magazine is inclined at an angle of from about 8° to about 15° with respect to a vertical such that the napkin stack has a lowermost portion and said metering member penetrates said stack about said lowermost portion.